King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
SYLLABUS
Semester I, 2010-2011 (**101**)
(Dr. Jawad Abuhlail)

Course #: Math 550
Title: Linear Algebra
Prerequisites Math 280 (Introduction to Linear Algebra)
Textbook: Linear Algebra: by K. Hoffman & R. Kunze, 2nd edition, Prentice-Hall (1971).

Week	Date(s)	Lecture	Section(s)	Topics
1	Sept. 25-27	Lecture 1	1.1, 2.1, 2.2 (review)	Fields; Vector Spaces; Subspaces
		Lecture 2	2.3	Bases and Dimension
2	Oct. 2-4	Lecture 3	2.4	Coordinates
		Lecture 4	3.1	Linear Transformations
3	Oct. 9-11	Lecture 5	3.2, 3.3	The Algebra of Linear Transformations; Isomorphism
		Lecture 6	3.4	Representations of Transformations by Matrices
4	Oct. 16-18	Lecture 7	3.5	Linear Functionals
		Lecture 8	3.6, 3.7	The Double Dual; The Transpose of a Linear Transformation
5	Oct. 23-25	Lecture 9	6.1, 6.2	Introduction; Characteristic Values
		Lecture 10	6.3	Annihilating Polynomials
6	Oct. 30 - Nov. 01	Lecture 11	6.4	Invariant Subspaces
		Lecture 12	---	**First Major (in class): Nov. 8th**
7	Nov. 6-8	Lecture 13	6.5	Simultaneous Triangulation; Simultaneous Diagonalization
		Lecture 14	6.6	Direct-Sum Decompositions
Id al-Adha Vacation: Nov. 11-21				
8	Nov. 22	Lecture 15	6.7	Invariant Direct Sums
9	Nov. 27-29	Lecture 16	6.8	The Primary Decomposition Theorem
		Lecture 17	7.1	Cyclic Subspaces and Annihilators
10	Dec. 4-6	Lecture 18	7.2	Cyclic Decompositions and the Rational Form
		Lecture 19	7.3	The Jordan Form
11	Dec. 11-13	Lecture 20	7.4	Computation of Invariant Factors
		Lecture 21	7.5	Summary; Semi-simple Operators
Second Major (Take Home): Due January 3rd, 2011				
12	Dec. 18-20	Lecture 22	8.1	Inner Products
		Lecture 23	8.2	Inner Product Spaces
13	Dec. 25-27	Lecture 24	8.3	Linear Functionals and Adjoints
		Lecture 25	8.4	Unitary Operators
14	Jan. 1-3	Lecture 26	8.5	Normal Operators
		Lecture 27	9.5 (partly)	Spectral Theory
15	Jan. 8-10	Lecture 28	10.1, 10.2	Bilinear Forms; Symmetric Bilinear Forms
		Lecture 29	10.3	Skew-Symmetric Bilinear Forms
16	Jan. 15	Lecture 30		Revision

Grading Policy:

First Major (in class)	**20%**	Homework	**15%**	Final	**40%**
Second Major (Take Home)	**20%**	Presentation	**5%**		